Jessitol Express: Building the Drug Manufacturing System\ Dacles

OBJECTIVES

By the end of this activity, you should be able to:

- Plan and visualize a modular Python folder/package structure
- Understand the role of `init.py` in Python packages
- Appreciate the value of project organization before coding

SCENARIO

You've been hired by **JessiePharma**, makers of the famous logic-enhancing drug **Jessitol** — the favorite pick-me-up for coders burning the midnight oil. The company is modernizing its **Drug Manufacturing System** by building a modular Python project.

Before touching the keyboard, your first task is to **draft the blueprint** for the package structure on your notepad. This step is crucial to understand how to organize the system's departments cleanly and logically.

YOUR TASK: DRAW THE PACKAGE STRUCTURE BLUEPRINT

Take out your **notepad or a blank sheet of paper** and **draw** the folder/package structure exactly like this:

Blueprint to Draw

```
drug_manufacturing/
|
├── raw_materials/
|       └── __init__.py
|       └── Recipe.py
|           └── generate_recipe()
|       └── Quality.py
|           └── check_quality()
```

```
 9  |       └── Inventory.py
10  |           └── filter()
11  |           └── record_to_inventory()
12  |
13  ├── processing/
14  |       └── __init__.py
15  |       └── Process.py
16  |           └── get_recipe()
17  |           └── casting()
18  |           └── molding()
19  |           └── machining()
20  |       └── Inventory.py
21  |           └── record_to_inventory()
22  |
23  ├── packaging/
24  |       └── __init__.py
25  |       └── Label.py
26  |           └── generate_logo()
27  |           └── labeling()
28  |       └── Packaging.py
29  |           └── fill()
30  |           └── seal()
31  |       └── Inventory.py
32  |           └── record_to_inventory()
33  |
34  ├── quality_control/
35  |       └── __init__.py
36  |       └── CheckQuality.py
37  |           └── testing()
38  |           └── approval()
39  |           └── rejection()
40  └── main.py
```

STEP-BY-STEP GUIDE TO BLUEPRINTING

1. **Draw the Root Folder**
   - At the top, write `drug_manufacturing/` — this is your main project folder.
2. **Draw the Departments (Subfolders)**
   - Underneath, draw four branches or indents for each department:
     - `raw_materials/`
     - `processing/`

- `packaging/`
- `quality_control/`

3. **Add the Package Marker**

    ○ Next to each subfolder, write `__init__.py` — this file marks the folder as a Python package.

4. **Add the Main Script**

    ○ At the bottom of the root folder, add the `main.py` file — this is your project's entry point.

THINK ABOUT THIS

- Why do you think each department gets its own folder and `init.py` file?
- What could happen if you put all the code into a single file or folder?
- How might this structure help JessiePharma add more departments or features later?

REFLECTION QUESTIONS

1. How does drawing the blueprint first help you before starting to code?
2. What are some advantages of planning folder structures in software projects?
3. Were you able to visualize how these folders relate to a real company's departments?

REMINDERS

- This is a **planning and visualization** step — no VS Code yet!
- Think of this like the architectural blueprint before building a house.
- Keep your blueprint neat — you'll use it soon to build the actual folders and files.

What is Manufacturing?

Manufacturing is the process of **converting raw materials into finished goods** using **tools, machines, labor, and processes**. These goods may be sold directly to consumers or used to produce other products.

> 🔁 Think of it as a recipe: ingredients (raw materials) + steps (processes) + tools (equipment) = finished dish (product).

⚙️ Key Manufacturing Processes

Here are the **five primary manufacturing processes**, often combined depending on the industry:

1. Casting and Molding

- **What it is:** Pouring liquid material into a mold to solidify into a specific shape.
- **Example:** Plastic bottles, metal parts in engine blocks.
- **Analogy:** Like putting jelly in a molder and letting it cool.

2. Machining

- **What it is:** Removing material from a solid block using tools (e.g., cutting, drilling, milling).
- **Example:** Car engine components, metal tools.
- **Analogy:** Like carving wood into a sculpture.

3. Joining (Welding, Soldering, Fastening)

- **What it is:** Combining two or more parts using adhesives, heat, or mechanical force.
- **Example:** Welding parts of a bicycle frame or soldering in electronics.
- **Analogy:** Like gluing Lego bricks or soldering a circuit board.

4. Forming (Forging, Stamping, Bending)

- **What it is:** Shaping materials by force, without removing material.
- **Example:** Shaping car hoods or metal pipes.
- **Analogy:** Like shaping clay or flattening dough.

5. Additive Manufacturing (3D Printing)

- **What it is:** Building objects layer by layer from digital designs.
- **Example:** Prototypes, small machine parts, even medical implants.
- **Analogy:** Like stacking pancakes to form a tower.